AGING AS A PROBLEM OF NUTRITION

EDWARD J. STIEGLITZ
M. S., M. D., F.A.C.P.
Washington, D.C.

Aging begins at conception and terminates only with death. Science will never find means of arresting aging, for it is part of living, though science may learn how to retard it or alter its consequences.

There are great differences between the rate of aging between different individuals and between different parts of the same individual at different phases of the life span. Thus, biologic age and chronologic age are by no means identical. The rate of aging is effected by use, disuse, and abuse of various structures. But even more closely related to the rate of aging are alterations in the supply, transport, and utilization of nutritional elements to and by tissue cells. Carrel's classical experiment with tissue culture of cells from the chick embryo heart demonstrated that with the maintenance of a continuously optimum nutritional medium and a prompt removal of the debris of metabolism, such cells are apparently immortal. It can be said that the nutrition of living cells is a major determinant of their mortality.

The phenomena of aging are of urgent importance to all of us. For we all age, and life has been extended enormously in the last half century. In 1900 the average life expectancy at birth was 47 years in the United States; today it is 67 for boys and 69 for girls!

Chronic Illness and Age

But mere survival is not enough. Life must have depth and breadth as well as length. Prolongation of life without continued health, happiness, and usefulness is but a partial victory. Far too many of the elderly are rendered relatively useless, and therefore miserable, by reason of the slowly progressive degenerative disorders characteristic of later maturity, such as arteriosclerosis, hypertensive arterial disease, arthritis, diabetes mellitus, anemia, and the like. It has been generally, but incorrectly, assumed that these insidious disorders are inevitable with aging.

Most of the significant chronic, progressive disorders of later years are consequent to metabolic, and therefore, also nutritional, abnormalities. The importance of prevention, of retardation, and of control of these chronic illnesses cannot be over-emphasized, for they are typically insidious and progressive. Once permanent damage has occurred, cure is improbable.

Our knowledge of the causation of most of these disorders is but fragmentary. There is much which must be learned before truly effective preventive programs can be worked out. But almost daily new studies are illuminating this confusing area of medical science. This much is certain: these disorders do not arise from some simple single factor. Their causation involves multiple, variable, and long continued insults. Nutritional excesses may be as, or more, significant causative factors than deficiencies. The studies of Professor Clive McCay have shown that the life span of rats can be greatly prolonged by retarding growth with balanced but calorically restricted feeding. The role of obesity in the causation and aggravation of diabetes mellitus is illustrative of damaging excesses.

Nutrition Research

Bits of information, like pieces of an immense jig-saw puzzle, are slowly accumulating. Ultimately, when there are enough pieces, they will fall into place and give us the picture of what aging is and explain what aging does. Recent studies point out that calcium requirements are greatly increased in later years. The older person needs more calcium than the young adult to maintain calcium balance. Calcium loss contributes to bone fragility. The importance of milk (as a source of both protein and calcium) for the elderly is thus once more re-emphasized. Newer knowledge of the role of protein in tissue repair (typically retarded in the aged) and in the correction and prevention of anemia, has made possible immense advances in geriatric surgery.

Dr. Stieglitz

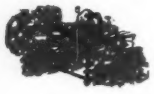
Both so-called "normal" and abnormal aging are inseparably linked with nutrition. We are today what we are because of what happened to us in our yesterdays. The older we become and the more yesterdays we accumulate, the more significant become all past experiences, both good and bad, nutritional or otherwise. The nutrition of the youth effects his health in maturity, senescence, and old age, but the nutrition of each period of life presents problems peculiar to the period. To age is to change.

Glances AT NUTRITION RESEARCH

The increasing awareness of the value of optimum health is making us delve more and more deeply into the role food nutrients play in keeping bodies healthy. The research abstracts in this issue describe the body's need for certain of these nutrients.

Effect of Milk on Child Growth — The effect of daily supplements of either whole or nonfat dried milk on the growth progress of a group of chronically undernourished children has been studied. Eighty-two children were paired on the basis of their state of nutrition and physical characteristics. Given otherwise similar diets, one child in each pair was supplemented with one quart of either reconstituted whole or nonfat dried milk each day, six days per week, for twenty months. Changes in growth during this period, as measured by the Wetzel Grid, showed that the children receiving the milk made significantly greater growth progress.

—J. Pediatrics 34:393 (April) 1949.

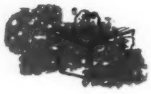


Sodium in Foods—The increasing use of low-salt diets for therapeutic purposes has made it necessary to know the salt content of daily foods. Therefore, sodium determinations on about 500 foods and 150 public water supplies are of interest. In general, foods of animal origin contain much sodium, while foods of vegetable origin contain little sodium. Milk is a typical animal food in regard to sodium content. Cow's milk contains 50 mg. of sodium per 100 gm., or nearly 500 mg. per quart. Butter and cheese are higher in sodium content because salt is added during processing.

—J. Am. Diet. Assn. 25:304 (April) 1949.

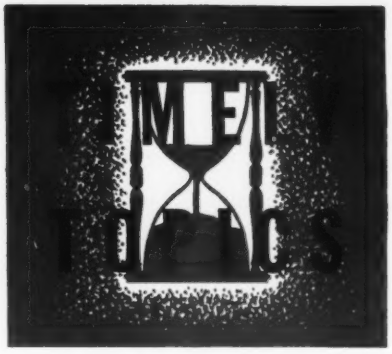
Intestinal Synthesis of Vitamins — A recent report concerns the importance of the intestinal microflora in the nutrition of animals. Nutrients synthesized by the intestinal bacteria may be asborbed directly from the intestinal tract or may be obtained through coprophagy. Results indicate that the intestinal flora is an important source of biotin and folic acid for the white rat. However, the type of protein in the diet was more important than the intestinal flora in meeting the animals' niacin requirements.

—J. Nutrition 37:443 (April) 1949.



Niacin Needs during Pregnancy — A study has been made of niacin utilization in pregnant and non-pregnant women. The dietary intake of niacin, the excretion of end products of niacin metabolism, and the response to test doses of the vitamin were studied in seven women during their first pregnancy, in 42 clinic patients, and in 12 non-pregnant women. Apparently more niacin is needed during the last trimester of pregnancy, consequently more is mobilized by the body and an increased excretion of niacin metabolites is observed. This greater need for niacin during pregnancy is confirmed by surveys showing an increased incidence of pellagra in women 25 to 45 years of age and in women who have borne several children.

—J. Nutrition 37:393 (April) 1949.



The author of this issue's lead article is a practicing internist, teacher, and research investigator in the fields of high blood pressure, kidney disease, gerontology (the science of aging), and geriatrics (the medical care of the aging and the aged). Two of his more recent books, one for educated laymen and the other primarily for physicians, are reviewed in this issue. Doctor Stieglitz practices in Washington, D.C.

The new assistant director-general of the World Health Organization is Dr. Martha M. Eliot who for 25 years was with the U.S. Children's Bureau. She now is responsible for the department of operations in the world-wide fight against disease and for maternal and child health, nutrition, and sanitation. Seventy countries joined in this year's Assembly of WHO.

American city families spent 32 percent of their income on food in 1948 as compared with 26 percent in 1942. This survey figure was released by the Bureau of Human Nutrition and Home Economics, U.S. Department of Agriculture. The increase, however, indicates better nutrition. While due in part to higher prices, it was due also to higher consumption of such foods as milk, fruit, vegetables, eggs, and meat.

SEVENTH INTERNATIONAL CONGRESS OF HOME ECONOMICS

By Helen S. Mitchell, Ph.D., Dean of School of Home Economics, University of Massachusetts

Internationally-minded home economists, 600 strong and from 25 or more countries, gathered in Stockholm August 22 to 27, to discuss common problems and observe how professional people from other countries are trying to promote the ideal of better home and family living in a troubled world.

From far places we gathered—a hospital dietitian from South Africa, a director of home economics and radio programs from Israel, a rural sociologist from New Zealand, a teacher training specialist from Iceland, a school director from Greece, a teacher from British Guiana, along with 11 members from Canada and 40 from the United States, with Miss Marjorie Heseltine of the Children's Bureau as chairman of our group. France sent the largest delegation of 144 and little Switzerland 55 including the president of the International Federation of Home Economics, M. Joseph Piller of Fribourg. Naturally the Scandinavian countries, Great Britain, and the Benelux countries were well represented.

Regular sessions of the Congress were held in the mornings in the Swedish Parliament Palace, the Riksdagshuset, an imposing building situated on an island in the center of the city. Upon entering we ascended an elegant carpeted marble staircase, decorated with many flowers, to a wide balcony where we registered by countries.

Trips were scheduled each afternoon and all day Thursday in chartered busses or boats. The Swedish National Committee, headed by Miss Anna Schenström were delightful hostesses. Many local members even entertained visitors in their homes for a Swedish meal.

The formal sessions emphasized:

1. the psychology and pedagogics of home economics education; 2. concrete problems set by the conditions of living due to modern civilization; 3. technics of home economics education. Resolutions passed at the concluding session will be sent to the governments represented.

While the plan of education, the types of schools, and the basic science prerequisites for college students in home economics vary greatly in different countries, it was obvious that the professional groups were attempting to analyze the needs of and raise the standard of training for girls in their respective countries. Most European countries offer a special diploma for two or three years of concentrated work in "Domestic Science"; some include a year of practical work; some require a year or more of liberal arts studies. Few have a scientific curriculum in Home Economics in the universities leading to a degree such as the B.S. in the United States.

We Saw As Well As Heard

The Congress program was planned to show rather than tell the visitors about home economics education and facilities in Sweden. A tea served by students at Maria Housewifery School, a luncheon by students at Sånga-Säby, the rural agriculture school sponsored by the Swedish Association of Agriculture and a luncheon at Uppsala Castle served by students from the Domestic Science Training College were excellent demonstrations of this practical training. On each occasion the students serving were in immaculate and colorful uniforms and tables were artistically decorated. Good standards of food preparation and attractive service were notable. Milk was served to every one with the luncheons and coffee with or after dessert. Even the sandwich lunch provided on the boat trip to Sånga-Säby was accompanied by one-third liter bottle of milk. A typical school lunch—pressed meat, creamed cabbage, boiled potatoes, milk, rye crisp, and cheese—was served to us at a new secondary school—well equipped for home economics.

The official banquet, served in the gold mosaic room of the famous Stockholm Town Hall, the Stadshuset, and colorful folk dances afterward were a fitting climax to a delightful week when even the weather man smiled on us every day after weeks of cold damp weather.

A NUTRITION ACTIVITY IN ELEMENTARY SCHOOLS

By Frances Curtin, School Nurse, Birmingham, Michigan

Ed. Note: It was due largely to Miss Curtin's observations of need for better eating practices and her enthusiastic leadership that this all-schools activity was promoted and captured the interest of teachers, children, and parents.

The most exciting nutrition project conducted in the Birmingham schools was a white rat feeding experiment. It filled a need for some realistic means of stimulating improved eating habits among the pupils. At first, as an all-schools activity, it seemed a terrific undertaking. But community resources, the State Department of Health and the Dairy Council of Detroit, gave us encouragement and practical aid.

An important factor was the School Health Council. Student representatives from health clubs in each school form the Health Council which focuses its attention on matters concerning all schools and the community. With such organization schools may concentrate on a common problem at one time.

The fifth and sixth grades were chosen for direct participation in the rat feeding study. Children at this level are assuming much responsibility in the choice of their foods. Preliminary meetings with teachers were held to establish aims and lay plans.

The pupils approached the project through their science studies. Class discussions about caring for the animals and signs of growth and health prepared the pupils for the feeding activity. Building cages to house the rats gave opportunity for some pupils who had difficulty in self expression to receive approval of classmates.

The Experiment

A pair of laboratory white rats was secured for each fifth and sixth grade classroom—14 pairs in all. Prepared dry rat food was used. One rat had a complete diet including milk, the other, food lacking in milk and certain other foodstuffs. Growth charts were

(Continued on Page Four)

DID YOU KNOW

—that it is estimated 14.5 percent of the population will be 65 or over in 1980, as compared to 6.8 percent in 1940?

—that a process for drying milk in the sun is recorded in the journals of Marco Polo?

—that there is twice as much waste from home-packed school lunches as from those prepared in lunchroom kitchens?

—that in Norway, ice cream cones are sold primarily by kakers (cake bakers)?

—that the chemicals in the human body, once valued at 98 cents, are now worth $31.04?

—that caves have been dug in cliffs along the Mississippi River at St. Paul like those of Roquefort, France, to ripen delicious Roquefort cheese?

—that dentists are reaching people along the coast of Alaska with mobile dental units aboard the small vessel, M/S Hygiene?

—that Hindoo writing, dating back at least 2000 B.C., indicates that butter was used in connection with religious ceremonies?

THINGS YOU'LL LIKE TO READ

The Second Forty Years—Edward J. Stieglitz, M.D. J. B. Lippincott Company, Philadelphia, Pennsylvania. 1946. $3.95.

Maintaining a healthy body and mind after 40 takes increased judgment and effort. Dr. Stieglitz combines his scientific knowledge of geriatrics and social sense to help the lay group cope intelligently with aging. Those of middle years and older, and those concerned with the welfare of this group, will find this an interesting and valuable book.

Geriatric Medicine—2nd Edition. Edited by Edward J. Stieglitz, M.D. W. B. Saunders Company, Philadelphia, Pennsylvania. 1949. $12.00.

This second edition is enlarged to cope with both the increased importance and knowledge of geriatrics. It deals, technically, with anatomic, physiologic, and mental changes. The field of geriatrics is covered by 47 authorities who contributed to this book.

The United States Department of Agriculture has released recently more publications of practical use for school lunchroom managers. They run the gamut of information from planning lunchrooms to quantity recipes. Aids in operating lunchrooms are included in **Planning and Equipping School Lunchrooms,** PA-60; **Storage for School Lunch Food and Supplies,** PA-63; and **Increasing the Efficiency of the School Lunch Kitchen,** PA-61. Help in appraising lunchrooms, complete with charts, is given in **A Yardstick for School Lunches (revised),** PA-50. Recipes encouraging more varied use of certain foods is available in **School Lunch Recipes Using Fish,** PA-66, **School Lunch Recipes Using Honey,** 1044, and **School Lunch Recipes Using Tomato Paste,** 1040. Information Branch, Production and Marketing Administration, U. S. Department of Agriculture, Washington 25, D. C.

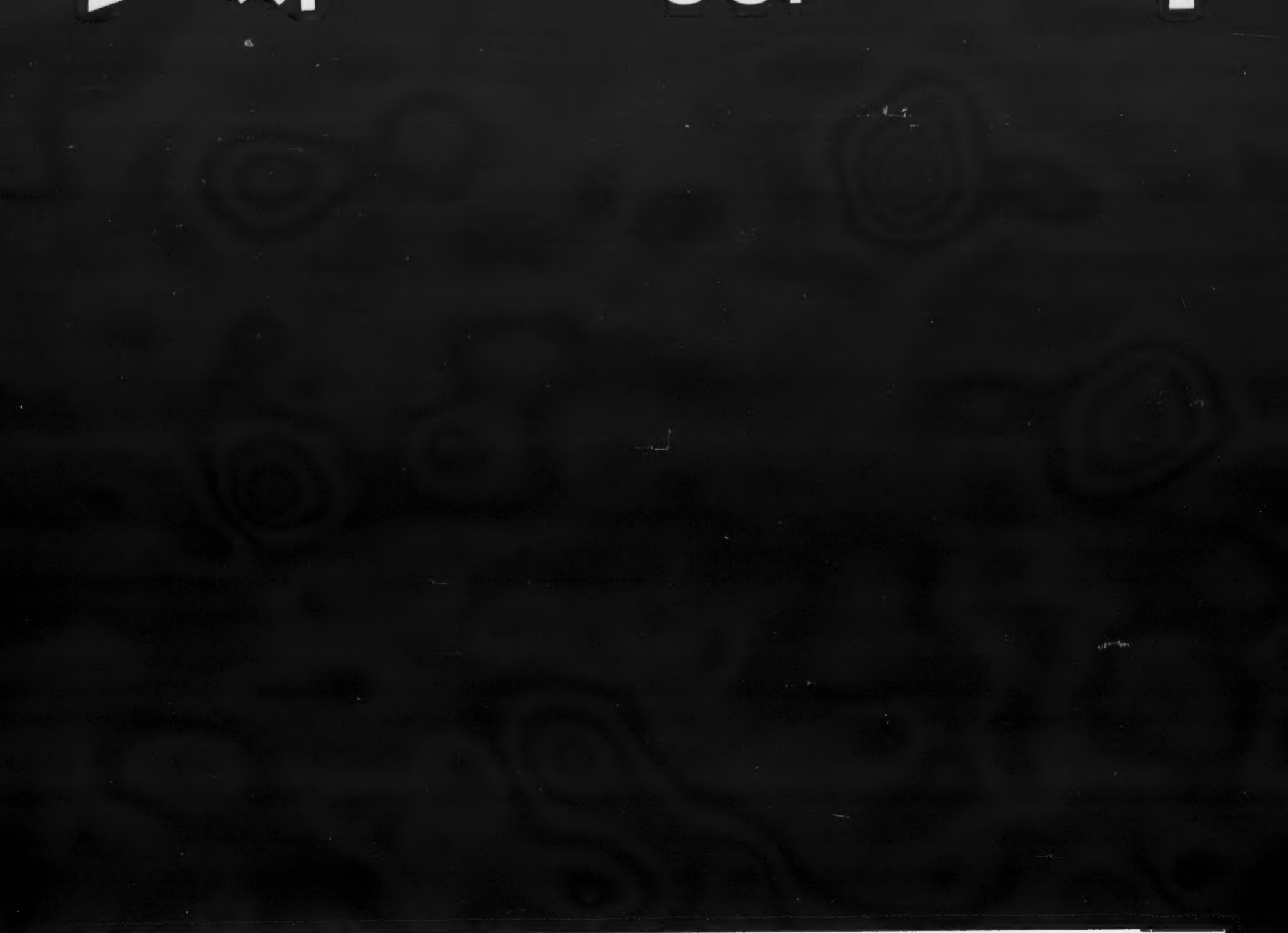
A NUTRITION ACTIVITY IN ELEMENTARY SCHOOLS

(Continued From Page Three)

kept. When a difference in size was apparent, the malnourished animal was transferred to the "good" diet. The children wanted him to "catch up." Pupils had the responsibility from the start in planning, feeding, cleaning the cages, weighing, keeping records, and caring for the animals over weekends. There was no danger of any rat getting a morsel he wasn't supposed to have for the pressure of class spirit in this study was strong.

During this time, food necessary to humans was an important topic in science classes. Textbook information was supplemented by National Dairy Council booklets, not only in the fifth and sixth grades, but in all grades. The curiosity of all the children created a natural opportunity for nutrition teaching at every grade level.

Three hundred fifty pupils were engaged actively in the experiment. However, it reached the entire enrollment of all the six schools. Pupils visited the lower grades to show the animals, tell of the study, and share their new ideas of food. "Open House" for parents was held in one school. Later, these young people prepared a program for the junior high school students.

Though the experiment lasted only six weeks, related activities continued. Arithmetic, English, auditorium, and art classes were involved in preparing the program for the junior high school. Here was opportunity for pupil initiative in interpretation. One class pictured highlights of the rat study in colored slides and prepared recordings to accompany them. These have been loaned to other groups. Enthusiasm of pupils, teachers, and parents exceeded all expectations.

The impression on the children is evident in ideas and habits of eating. Committees were formed to investigate certain questionable practices in schools. Evaluations by pupils indicated many voluntary changes in food habits. Several parents commented on children's new interest in eating proper food. Nor did this die. The seventh grade homemaking teacher finds that girls who had participated in this study show unusual interest in their food classes. The experiment was so successful that plans are underway for a similar project every two years.